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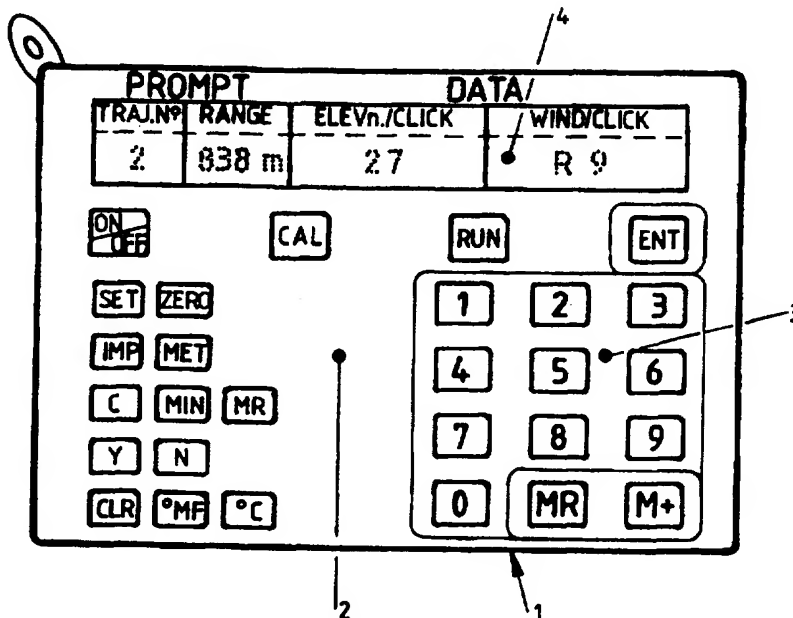
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(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published

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(54) Title: BALLISTIC CALCULATOR



(57) Abstract

A ballistic calculator, pocket sized, that when loaded with trajectory and wind drift data derived from firing tests, ballistic tables or computer predictions, will, when used in the field modify the data to give the user actual sight settings at each entry of site environmental and target orientation data requested in the display.

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BALLISTIC CALCULATOR

This invention relates to a ballistic calculator for marksmen.

Many factors determine whether a target can be hit by a remote projectile fired from a hand held or hand supported weapon. These factors include range, temperature, air density, firing angle, wind strength and direction and drift due to spin stabilized bodies in air.

Up to now, hitting the target using such a weapon, especially at the longer ranges has been a hit or miss affair because :

- (a) No account is made of the variables, especially when moving from one venue to another.
- (b) Account is made of only some of the factors.
- (c) Some account of the factors is made by human 'guestimation'.
- (d) Detailed account is made by the use of complex tables which have generally fixed intervals involving time, clear thinking and extrapolation to obtain accuracy.
- (e) Detailed account is made by use of full sized computers, but use is limited by the fact that they cannot be taken into the field and therefore the programme input is not matched to the exact firing conditions.

According to the present invention there is provided a ballistic calculator that is a pocket sized, hand held electronic unit specifically designed to provide the marksman's sight settings for elevation and azimuth (windage) in angular MILS/MOA or 'clicks' according to the input of environmental conditions and target orientation at each firing sight.

The invention consists of a method of input, a memory, an electronic micro processor and an output display. The ballistic calculator is programmed using baseline data provided, input and stored from actual firing tests, computer ballistic data or ballistic tables for the particular weapon, sight and projectile to be used, at a site of known topographical and environmental conditions.

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In the field, the micro processor calculates and displays in terms of sight settings, changes to the baseline trajectory and wind drift data as each piece of environmental or target orientation data is asked for in the 'prompt' display and entered.

Field use does not affect the stored baseline data.

Each Field use setting used can be stored for future recall should it be needed.

The ballistic calculator can be constructed to be used as a stand alone item, an item connected to various sensors for recording environmental, site and target orientation, as either above, but built into a sighting or weapon system as an integrated part of that system.

A specific embodiment of the invention will now be described by way of example with references to the accompanying drawing labeled Fig 1.

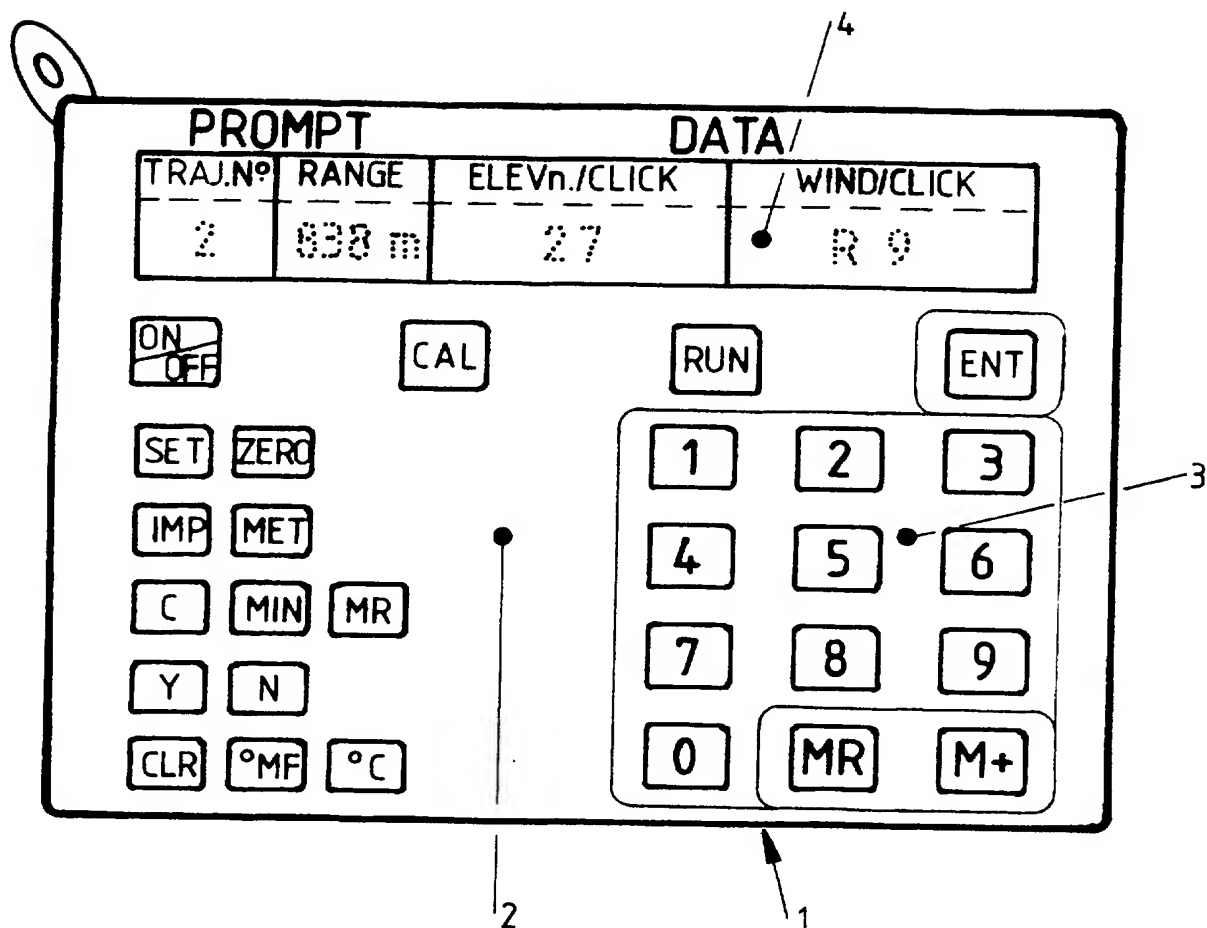
Fig 1 shows the face of the main panel of the calculator.

Referring to the drawing, the ballistic calculator comprises an environmentally sealed casing 1 containing the electronic circuitry micro processor, input keys, display and power service on function input key panel 2, used for loading the basic trajectory and wind ballistic data of the weapon, sight and projectile to be stored in the memory and a 'Field' numerical key panel 3 used at the firing site to input the requested environmental and target orientation information, requested in the 'Prompt' display 4, where the final sight corrections for elevation and windage will also be shown on completion of the calculations.

CLAIMS

1. A ballistic calculator that is a pocket sized, hand held electronic unit specifically designed to provide the marksman's sight settings for elevation and azimuth (windage) in angular MILS/MOA or 'clicks' according to the input of environmental conditions and target orientation at each firing sight.
2. A ballistic calculator, as claimed in Claim 1, that is programmed/set up/calibrated prior to field use with trajectory and wind drift co-ordinates which are obtained from ballistic tables, computer programmes or live firing zeroing exercises.
3. A ballistic calculator, as claimed in Claim 1 and Claim 2, that provides the 'come-ups' or 'setting' or 'elevation' in angular form or clicks from an established zero setting or base line which corresponds with the zero setting or base line in or on the sighting system.
4. A ballistic calculator, as claimed in Claim 1 or Claim 2 or Claim 3, that will provide a wind deflective readout in angular form or clicks with each elevation readout given.
5. A ballistic calculator, as claimed in Claim 1, 2, 3 and 4 that will calculate and show an elevation and wind deflection readout at the input of any relevant information prompted, at each entry of relevant information requested or 'prompted'.
6. A ballistic calculator, as claimed in Claim 1, 2, 3, 4 and 5, that will automatically carry out computations to integrate drift caused by a spin stabilized projectile and show this in each readout.
7. A ballistic calculator, as claimed in Claim 1, that will record 'saved' data to memory for recall later.
8. A ballistic calculator, as claimed in Claim 1, wherein environmental gauges are built in and integrated with the microprocessor and these will include range, altitude, temperature, uphill/downhill angle and azimuth.
9. A ballistic calculator, as claimed in Claim 1, wherein a 'hit probability' function is built in to the microprocessor.

10. A ballistic calculator, as claimed in Claim 1, wherein is built adaptation capability to be added in to or integrated with weapons, sighting systems or environmental measuring equipment.

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FIG. 1

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 96/00735

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 F41G3/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 F41G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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| A | PATENT ABSTRACTS OF JAPAN vol. 18, no. 79 (M-1557), 9 February 1994 & JP,A,05 288495 (MITSUBISHI HEAVY INDUSTRIES LIMITED), 2 November 1993, see abstract; figure | 1 |
| A | --- PATENT ABSTRACTS OF JAPAN vol. 15, no. 318 (M-1146), 14 August 1991 & JP,A,03 117898 (MITSUBISHI ELECTRIC CORPORATION), 20 May 1991, see abstract; figures | 1 |
| A | --- WO,A,87 01190 (SAAB INSTRUMENTS AB) 26 February 1987 see abstract see page 6, line 4 - page 10, line 15; figures 1-6 ----- | 1 |

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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